

## ABSTRACT OF THE DISCLOSURE

A method of detecting in a GSM downlink signal a frequency correction burst signal uses a correlation technique that is insensitive to the amount of frequency offset from a nominal carrier frequency. Instead of using a constant reference vector as a reference signal, a delayed version of the downlink signal itself is used as the reference signal with the time delay set to a period that ideally causes the delayed version to overlay the current version of the signal, such as an integer multiple of four times the symbol period for a GSM downlink signal. Then the correlation result produces a maximum correlation magnitude to detect the FCB signal that is insensitive to any frequency offset. The resulting correlation vector phase angle may then be used to estimate the frequency offset in the GSM downlink carrier frequency. Further for small frequency offsets a variation may be implemented that uses only the real components of the correlation product to improve computational efficiency.